

Consulting and Training | Reach New Heights

Course Name

Electrical Distribution System Optimization

Sector Name

Electrical Engineering

Document Type

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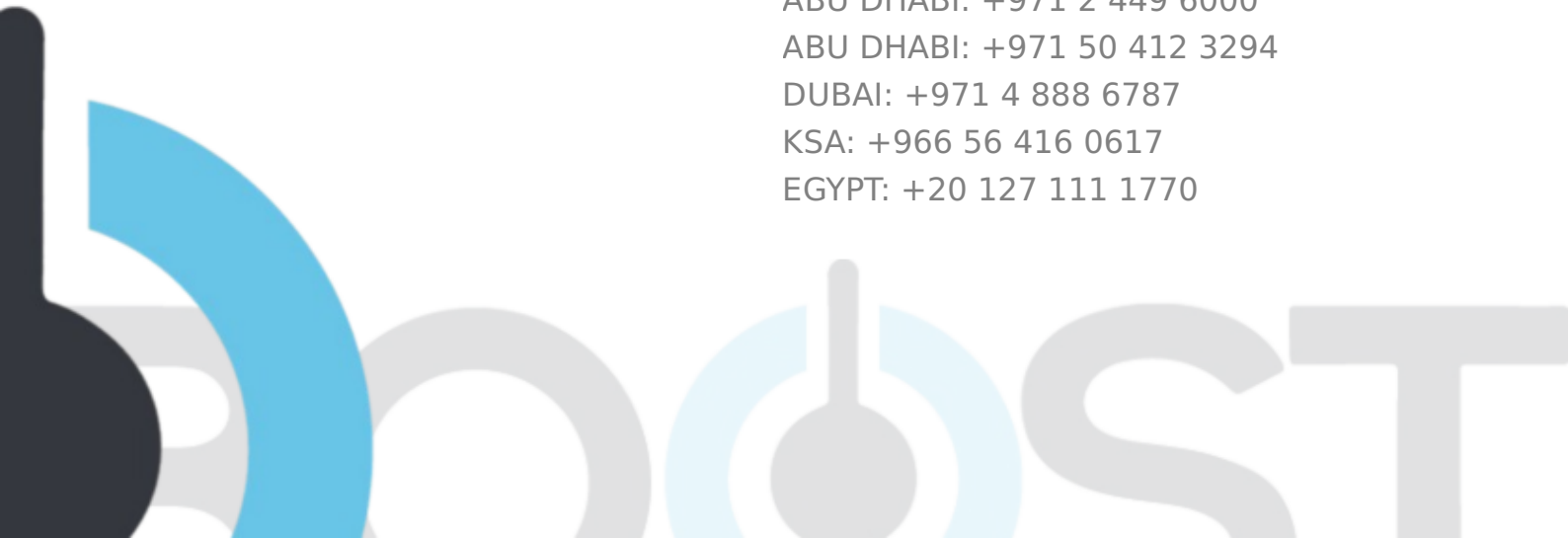
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Electrical Distribution System Optimization

Course Introduction

Electrical distribution systems often evolve gradually as facilities expand, loads change, new equipment is connected, and operating requirements increase. A network that was appropriately configured when first designed may later experience overloaded feeders, excessive losses, poor voltage profiles, underused capacity, transformer loading problems, or inefficient operating arrangements. Adding more capacity is not always the best solution; in many cases, significant improvement can come from understanding how the existing system is being utilized.

Boost Consulting & Training has designed this course to help electrical engineers evaluate and improve the performance of existing distribution networks. Participants will examine load behavior, transformer and feeder utilization, voltage performance, electrical losses, reactive power, network configuration, and capacity constraints. The program emphasizes identifying where system performance is being lost and comparing practical optimization measures before additional infrastructure or major upgrades are considered.

The main concept of this course is to extract better performance from electrical distribution systems by matching network

configuration and available capacity more effectively with actual load and operating conditions.

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Target Audience

- ✓ Electrical and power systems engineers
- ✓ Distribution and network engineers
- ✓ Plant and facility electrical engineers
- ✓ Electrical operations and technical professionals

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Electrical Distribution System Optimization

Learning Objectives

- ✓ Evaluate the operating performance of electrical distribution systems.
- ✓ Analyze load patterns and their impact on network capacity and equipment utilization.
- ✓ Identify overloaded, underutilized, and inefficient sections of a distribution network.
- ✓ Assess voltage performance and determine the causes of unacceptable voltage conditions.
- ✓ Identify major sources of technical losses within electrical distribution systems.
- ✓ Evaluate opportunities for load balancing, reactive power improvement, and network reconfiguration.
- ✓ Compare optimization measures with conventional capacity expansion solutions.
- ✓ Develop practical improvement recommendations for existing electrical distribution networks.

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Electrical Distribution System Optimization

Course Outline

✓ DAY 01

Reading the Distribution System as It Operates

Building the Network Performance Picture

- ✓ Reviewing sources, transformers, feeders, distribution boards, major loads, and network operating arrangements
- ✓ Comparing design assumptions with current loading and actual operating conditions
- ✓ Identifying network sections requiring deeper performance investigation

Understanding Load Behavior

- ✓ Analyzing demand profiles, peak periods, load diversity, and changing consumption patterns
- ✓ Identifying uneven utilization across transformers, feeders, and phases
- ✓ Developing a Distribution System Performance Map from a realistic network case

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Course Outline

✓ DAY 02

Optimizing Capacity & Equipment Utilization

Transformer & Feeder Loading

- ✓ Evaluating loading levels against equipment capability and operating conditions
- ✓ Identifying persistent overload, short-duration peaks, and unnecessary underutilization
- ✓ Examining how load growth and redistribution affect available system capacity

Balancing Electrical Loads

- ✓ Assessing phase imbalance and uneven loading across distribution sections
- ✓ Redistributing loads to improve equipment utilization and release constrained capacity
- ✓ Completing a Load Rebalancing Challenge without introducing additional equipment

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Course Outline

✓ DAY 03

Improving Voltage & Reactive Power Performance

Managing Voltage Across the Network

- ✓ Evaluating voltage profiles from supply points to downstream loads
- ✓ Identifying voltage-drop problems associated with loading, conductor characteristics, distance, and configuration
- ✓ Comparing practical measures for improving voltage performance

Optimizing Reactive Power

- ✓ Examining the impact of reactive demand and poor power factors on current, losses, and usable capacity
- ✓ Evaluating compensation requirements and suitable locations for corrective measures
- ✓ Developing a Voltage & Reactive Power Improvement Solution for a constrained distribution system

Electrical Distribution System Optimization

Course Outline

✓ DAY 04

Reducing Distribution Losses

Finding Where Electrical Losses Occur

- ✓ Examining losses across transformers, feeders, conductors, connections, and distribution equipment
- ✓ Connecting loading patterns and equipment utilization with technical loss behavior
- ✓ Identifying sections where improvement can deliver meaningful performance gains

Evaluating Network Configuration

- ✓ Comparing alternative feeder arrangements and operating configurations
- ✓ Assessing the effects of load transfer and reconfiguration on losses, voltage, and equipment loading
- ✓ Running a Network Optimization Scenario using alternative distribution arrangements

Electrical Distribution System Optimization

Course Outline

✓ DAY 05

Making Better Use of the Existing Network

Comparing Optimization Options

- ✓ Combining load balancing, reactive compensation, voltage improvement, reconfiguration, and targeted equipment changes
- ✓ Evaluating technical benefits against implementation constraints and operational disruption
- ✓ Distinguishing problems that can be optimized from genuine capacity limitations requiring expansion

Developing the Distribution Improvement Strategy

- ✓ Prioritizing optimization measures according to system impact and engineering feasibility
- ✓ Establishing performance indicators for verifying improvements after implementation
- ✓ Producing an Electrical Distribution Optimization Plan for an integrated network case

Electrical Distribution System Optimization

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 28, 2026	Jan. 1, 2027	5 days	4250.00 \$	UAE , Abu Dhabi

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